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Relaxation time scales in collective dynamics of liquid alkali metals

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Abstract

The dynamical processes of liquid alkali metals, executed by analyzing the time scale of relaxation processes in liquids, were investigated. It was shown that the obtained theoretical dynamic structure factor S(k, w) for the case of liquid lithium was found to be in excellent agreement with the inelastic X-ray scattering data. The confirmation of the scale uniformity of the dynamic processes in liquid alkali metals was predicted by some molecular dynamic simulation studies. It was concluded that the theory, developed on the basis of Bogoliubov ideas about the hierarchy of relaxation times, allows to obtain dynamic structure factor, reproducing adequately experimental IXS spectra for liquid alkali metals in the region of low values of wave number.

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